



Fig. 1. Commercial pruning method employed in Israel on 'Anna' and 'Ein Shemer' apple trees.

branches may be similarly trained by hanging weights from them or by anchoring them to stakes driven into the ground.

Conclusions

Clearly, much has been learned since the 'Anna' and 'Ein Shemer' were first offered to the public. Production of trees has increased greatly. Serious pests and disease problems have been shown to exist, but with an effective pollinator and proper training, the 'Anna' may well become a common fixture in North Florida backyards. On a commercial scale much more experience with the tree is needed before large plantings are undertaken.

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MARKETING FLORIDA BUNCH GRAPES AS FRESH FRUIT¹

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Abstract. Tests of marketing Florida bunch grapes through central Florida retail outlets were conducted in 1973, 1975, and 1976. The predominant variety in these tests was 'Stover' (light green to golden color), but limited amounts of blue- and red-skinned grapes were also sold. Grapes were marketed through one large retail chain and several smaller local stores, over a period of 3 weeks, usually prior to the availability of full-ripe 'Thompson Seedless' grapes from Arizona and California. Retail price ranged from 39 to 49 cents per pound (lb)² in packaged cartons of about one pound. Wholesale price varied from year to year and with packaging; in 1976 grapes were sold to the stores at 31 cents per pound in 15-pound cartons. The stores were pleased to get the grapes as offered and had good success in selling them. Blue and red grapes were more popular than golden ones.

Culture of grapes in Florida for commercial uses has never been extensive. Although early French, Spanish, and

English colonists imported European varieties of *Vitis vinifera* L. with the idea of establishing them here, none of these attempts were successful. In the latter part of the nineteenth century immigrants to Florida from the northern parts of the United States brought with them varieties of *Vitis labrusca* L. and were successful in establishing small commercial plantings, the most extensive in Orange County. But many of these plantings were dead by 1900 and commercial efforts were ended by 1907. The most successful efforts at commercial production of grapes in Florida occurred in the period 1920-30. This industry was founded on the use of the Texas post-oak hybrids ('Extra' [also known as 'Florida Beacon'], 'Carman,' 'Armalaga,' R. W. Munson, and others) developed by T. V. Munson. About 4,000 acres of vineyard (mostly in the central Florida counties of Lake, Orange, and Putnam) were under cultivation at the peak of this development (6). Failure of these attempts to establish commercial vineyards in Florida was caused by degeneration and eventual death of the vines that was attributed to various causes. Not until 1951 was Pierce's disease suspected as a major factor in the death of grapevines previously described as degeneration or decline (4). Subsequent work corroborated this finding (1, 5). The grape research program at the Agricultural Research Center, Leesburg was directed in the early 1940s to the collection of specimens of native grape species that were used as sources of resistance for the development of the Pierce's disease-resistant varieties 'Lake Emerald', 'Blue Lake', 'Norris', 'Stover', and 'Liberty'

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²For metric conversions, see the table near the front of this Volume. Ed.

(2). While these varieties have proved long-lived and popular as dooryard fruit varieties, none has been grown extensively in commercial plantings. The present study was undertaken to determine the potential for the marketing as fresh fruit of several of these varieties.

Scope of Marketing Tests

Tests of marketing Florida bunch grapes through central Florida retail outlets were conducted in 1973, 1975, and 1976. Grapes were marketed primarily through one large retail chain (Pantry Pride) and several non-chain local stores. They were transported by us unrefrigerated to the retail outlets. The predominant variety was the light green to golden 'Stover' grape (3), but limited amounts of blue ('Blue Lake' and 'Norris') and red (Fla. F4-36) grapes were also sold. Grapes were marketed over a period of 3 to 4 weeks from the last week in June through the third week in July, for the most part prior to the availability of full-ripe 'Thompson Seedless' grapes from Arizona and California. While the total volume of grapes sold in these tests was limited, it was judged sufficient to test their acceptability to the retail trade.

Picking and Packing Procedures

1973

Grapes were picked in 20 lb wooden lugs, transported to a screened enclosure adjacent to the vineyard, and packed in 1 lb plastic trays; the trays were then placed, 8 to the carton, in shallow covered cardboard cartons. The uncovered trays were wrapped in saran transparent film by the retailer prior to sale. Our experience this year indicated that the amount of handwork by us was excessive and the store personnel expressed a preference for preparing the final sales package themselves.

1975

This season grapes were picked in 20 lb lugs and transported to the packing area, where they were repacked into 15 lb (net) covered cardboard cartons. This was a modified avocado carton that is used commercially in south Florida. Personnel at the retail stores made up trays of various sizes and usually covered them with saran wrap. Our handling and transporting of the grapes prior to delivery to the stores was still excessive, resulting in extra labor costs and considerable loss of fruit.

1976

In the final season of this test we used a tractor-drawn mobile packing unit that was narrow enough to travel between the vineyard rows. This unit was fitted with a grading table and chairs to accommodate 2 packers. It was constructed to allow the packers to repack from a 20 lb field lug to a 15 lb finished carton, disposing of the cull berries and juice or wine grade fruit in two separate chutes. After repacking, the finished cartons were ready for immediate transport to cold storage or directly to the retail store. The procedures used in 1976 were a considerable improvement over methods used in 1973 and 1975. Using the 1976 procedures of picking and packing, 3 packers are required to handle the grapes harvested by 2 pickers, but additional experience may indicate that a different ratio is desirable.

Results of Marketing Tests

Total sales and income at wholesale for these tests were as follows: 1973, 600 lb at 35 cents; 1975, 1250 lb at 26 1/2

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cents; 1976, 1125 lb at 31 cents. Retail sale prices ranged from 39 to 49 cents per pound.

Comments of store personnel and (indirectly) customers regarding the grapes were solicited during and after the 1975 and 1976 seasons by the senior author. Those of a favorable nature included statements that sales of the grapes "went over very well" with the customers, that the grapes were very juicy and had good flavor, that their earliness (seasonally) was a distinct advantage, and that shelf life of the grapes was satisfactory ("spoilage of fruit was no problem"; "fruit held up in the store for a week or more"). Comments of an adverse nature included objections to seediness of the grapes (the most commonly expressed complaint) and a reference to the toughness of the skins. Two salespersons stated that blue and red grapes were preferred over golden ('Stover') grapes by some customers, but another opinion indicated that fruit color was not too important.

Generally, store management personnel were pleased to obtain the grapes as offered in 1975 and 1976. They had good success in selling them and could have sold more than we were able to supply. Their losses through spoilage were minimal. The retail chain operator had asked to be supplied again in 1977 and was disappointed that we were unable to carry out our test studies this past season. He expressed the opinion that they very likely would be willing to pay a slightly higher wholesale price than that paid in 1976.

Projected per Acre Costs and Returns for 'Stover' Grape in 1976

In order to consider the economic feasibility of producing Florida bunch grapes for fresh sale in local markets we have drawn on our experience from these tests and other work to project a per acre costs and returns schedule for producing 'Stover' grape for local market sale in 1976 (Table 1). We have made some arbitrary assumptions with regard to yields and costs and have excluded capital costs and transportation to market costs in our calculations, but we have attempted to be conservative in not overestimating yields and underestimating costs. Assuming a total yield of 4 tons per acre for Stover grape, grading 6000 lb suitable for fresh sale at 31 cents/lb and 2000 lb of wine grade and culls at a total value of \$150/ton, we arrive at a gross income of \$2010 per acre. Estimating production costs of \$500 per acre and total harvesting costs of \$740 per acre, we arrive at total production and harvesting costs of \$1240 per acre. Excluding costs of capital investment and costs of temporary storage and transportation to market, this allows net income of \$770 per acre.

Table 1. Projected per acre costs and returns for 'Stover' grape in 1976.

Income		
Fresh fruit (6000 lb)	\$1860	
Wine grade and culls (2000 lb)	150	
Total		\$2010
Costs ^a		
Production	500	
Harvesting (400 cartons)		
Cartons @ 35¢	140	
Picking @ 60¢	240	
Packing @ 75¢	300	
Mobile unit (driver and operating)	60	
Total		1240
Net return ^a		\$ 770

^aCosts for capital, storage, and transportation to market not included.

Discussion

This study was carried out on a much smaller scale than would be feasible for even a minimal commercial operation. Undoubtedly, considerable savings in costs of operation would accrue from larger scale endeavors than ours. Also, response of the chain store management personnel to our pricing of the grapes indicated that a higher wholesale price to the grower is a reasonable expectation. Conversely, various problems attendant to a larger scale commercial operation would need to be worked out, e.g., consideration of a vineyard planting design to accommodate a larger mobile packing unit would be desirable. Costs of capitalization for the establishment and operation of such a vineyard enterprise would need to be considered. Refinements of the picking and packing operations would be desirable, and costs of transportation to the retail stores as well as short-time storage at the vineyard (both requiring refrigeration) would need to be figured. Results of this study, however, show that a vineyard operation based primarily on the sale of currently available Florida bunch grapes, especially the variety 'Stover', has promise of being successful.

Especially pertinent to the successful marketing of Florida bunch grapes as fresh fruit is the availability of high quality fruit in the vineyard prior to harvest. Having good fruit will depend on all those factors that determine the

success or failure of any vineyard operation: choice of a suitable site, care in establishing the young vineyard, and thoroughness in carrying out recommended cultural practices. Particularly important in maintaining fruit quality is a complete pest control program. High level control of diseases, insects, and weeds by a carefully planned and executed program, including year-round practices of sanitation, may well determine the success or failure of any enterprise in the production and sale of Florida bunch grapes as fresh fruit.

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ECONOMIC TRENDS IN THE FLORIDA AVOCADO INDUSTRY

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Abstract. Avocado acreage has been expanding in Florida and California. Planting data indicate a 23 percent increase in bearing acreage for Florida by 1980-81 and a 60 percent increase for California. The combined bearing acreage is expected to increase from 34,550 acres¹ (1976-77) to approximately 52,800 acres by the 1980-81 season, a 53% increase. Yields are also increasing, at slightly over 5 bushels per acre per year. Thus, total production could exceed 10 million bushels by 1980-81. Increasing production will probably result in lower prices for growers.

Favorable prices have contributed to considerable interest in avocado production and in increased plantings in recent years. As with a number of tree crops, the full economic effects of current planting decisions will not be felt for at least three seasons and with some varieties, even four or five.

The primary objective of this report is to provide the avocado industry with information for production and marketing decisions during the next several years. Specifically, acreage and production trends are examined and projections made through the 1980-81 season for both Florida and California. The impact of projected changes in production on Florida growers' prices is then estimated.

Florida and California are the two major avocado producing states in the United States. In 1976, Florida ac-

counted for approximately 20% of the U.S. bearing acreage and California almost all of the remaining 80%. Thus, attention is focused on these major growing areas.

Procedure

All analyses were made using published secondary data for the 2 states which are available from various agencies of the United States Department of Agriculture (1, 2, 4, 5, 6, 9, 10).

Production trends were analyzed using annual observations for the 1967-68 through 1976-77 seasons. These seasons were viewed as the most relevant for analytical purposes since they encompass recent expansion and technological developments in both states. Further, this period excludes Florida's abnormally low yields of the 1965-66 and 1966-67 seasons which were the result of hurricane damage. The price analysis utilized data from 1955-56 through 1976-77.

Regression analysis (ordinary least squares) was used for projecting most variables such as yields and Florida prices. For some variables, recent historical averages and published estimates were used.

Findings

Acreage trends and projections

Florida. For many years, Florida avocado acreage was stable at just under 5,000 acres. After extremely slow growth in the early sixties, bearing acreage stood at 5,000 acres in the 1964-65 season. Five seasons later, in 1970-71, acreage had increased by 6% to 5,300 bearing acres. This past season, 1976-77, saw bearing acreage reach 6,900 acres, a 38% increase in 12 seasons.

Total bearing acreage for Florida is expected to increase

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¹For metric conversion see the Table near the front of this proceedings. Ed.